Treatment and Prevention Of Secondary disabilities of the mobility Impaired Through Assisted standing Technology

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Increasing evidence in the lifetime management of physical disability points to the horrendous impact of secondary complications of disability and its financial consequences. The study of the natural course history of mobility impairment in the disabled has established a consistent chain of predictable events that adds to the morbidity and mortality of these individuals.

This chain begins with individuals assuming any prolonged positional posture of sitting and/or lying or any recumbent posture that permits alteration of full extension required for standing and ambulating. Musculo-ligamentous imbalance associated with prolonged sitting in particular, produces predictable contractures in all individuals. When contractures are not reduced completely and continually, the patient will then develop immobilization osteoporosis further complicating the postural impediment. Contractures further limit sitting and lying postures and positions. This promotes longer periods in which skin surface areas are under inordinate pressure under bony prominences, promoting the development of pressure sores. The pressure sore phenomena will, at the very least, be subject to septicemia. Blood born abscesses and infection sites may be carried to any part of the body to further complicate this problem. In order to correct these problems, prolonged medical treatment with either recurrent high cost surgical care or long term medical hospitalization is often necessary. Thus, prolonged immobilization and sitting posture becomes a cumulative risk factor and the patient will require attendant care and develop the classical dependency found in many disabled individuals.

In order to treat existing contractures, or prevent their development in people with extensive non-ambulatory disability, it is absolutely imperative that this group of patients be given the opportunity to have a daily routine of stretching the tight contractures that develop in the above circumstances. This must be done manually by therapist, attendant or family member from the very onset of disability and for the remainder of the individual’s life, or it must be provided through mechanical-assisted standing devices that have been shown to effectively reduce and/or eliminate contractures.

To this end, many devices have been employed to reduce the dependency on an attendant or a family member for this process. These mechanical aids have included the Tilt Table used in hospitals and some homes; the Parapodium often used by children; leg and body braces either for assisted standing and/or assisted ambulation; stand-in-tables;

mechanically-assisted standing devices such as stand-in wheelchairs; and hydraulic and/or electric-assisted standing frames or electric mobility devices employing the same.

It has been demonstrated by many investigators, as well as clinicians dealing with these options, that the use of personal or manual assistance is often costly, prohibitive and unavailable and societal third party financial reimbursement programs will not pay for this continuity of care over a person’s lifetime. In the next instance, the use of braces, if not used for ambulation per se, are often difficult to apply and, again, require assistance if the person is non-ambulatory and requires assisted aids. The cost for a complete pelvic, knee, ankle, foot orthosis usually exceeds $3500.00 and is almost prohibitive if done for this cause alone. The use of stand-in frames or boxes also require the assistance of an additional aide or attendant to help the mobility impaired person arise from the chair and lock themselves into the stand-in device. This requirement for personal physical assistance in order to make the process regular and effective is also cost prohibitive. In the case of assisted standing devices coupled to wheelchair, these devices have not to this date shown the ability to bring the patient up to a standing position beyond 70 degrees so that the patient is always somewhat lying backwards and unable to perform any functional hand or arm activities.The wheelchair devices, the Tilt Table, as well as the stand-in frames never completely reduce the final 15-20 degrees of hip, knee and knee ankle flexion postures, so that complete obliteration of the contractures is never possible. Flexion is also acommodated on the Tilt Table. Most clinicians, to date, have therefore found that the most therapeutic, effective, as well as cost benefit situation, relies on the use of a hydraulic or electric-assisted standing frame or device, or an electric mobility device employing the same. The electric mobility devices that include assisted standing, while very effective, are very costly. Society is often not willing to cover these electric mobility devices through third party reimbursement process. Therefore, it has been found that the most reasonable and most physiologic and therapeutic effective device available to disabled individuals with this inevitable risk of contractures, osteoporosis and pressure sores, is that of the hydraulic and / or electric standing device. Usually the manufacturers of the hydraulic-assisted frame have been able to provide a more controllable, graduated, independently useable device than any of the other equipment on the market to date. It is also, therefore, the most inexpensive means available for providing long-term treatment or resolution of these problems. In addition, we have found that those who have spasticity have often had marked reduction of the level of their spasticity. The need for pharmacological agents that inhibit the spasticity has been significantly reduced by enjoining a daily standing program in a hydraulic -assisted standing frame. Furthermore, the adaptive compressive phenomena of the hydraulic-assisted standing frame, with

the abdominal pad, enhances the splanchnic pressure within the abdomen and promotes assisting refilling by the peripheral vascular system of the venous circulation to the right side of the heart and reducing the orthostatic hypertension that is often present in other types of standing devices, including orthotic devices. Therefore, given the attendant risk of allowing contractures and the associated chain of events that follows; and knowly permitting this chain of events in disability, leads one professionally to the conclusion that the failure to take appropriate steps to eliminate this predictable risk is tantamount to professional negligence by all parties concerned.

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